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Original Article

Paediatrics Section

Knowledge about Danger Signs in Neonates and Health Seeking Behaviour amongst Mothers Attending Tertiary Healthcare Centre in Punjab, India

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ABSTRACT

Introduction: The early identification of neonatal illness is critical for improving infant survival rates. Neonates are less likely to exhibit overt symptoms of sickness. The only signs of illness are often listlessness or non acceptance of feeds, and the illness can progress rapidly. There is a lack of data on mothers' knowledge of Neonatal Danger Signs (NDS).

Aim: To evaluate mother's awareness of NDS and health seeking behaviour.

Materials and Methods: An Institution-based descriptive cross-sectional study was performed in Punjab Institute of Medical Sciences, Jalandhar, Punjab, India, from 31st January 2020 to 31st March 2020. A total of 550 mothers attending the Outpatient Department (OPD) with their infants for immunisation were included in the study. Awareness of more than three NDS was considered as good knowledge, 1-2 NDS as poor knowledge and zero awareness was categorised as absent. Data was collected using a questionnaire and statistically analysed using Chi-square test.

Results: A total of 550 mothers were included in the study. The mean age of study participants was 26.5 years. A 273 (49.6%) had good knowledge of NDS. A 68 (12.4%) had zero knowledge and 209 (38%) had poor knowledge. Education status of the mother (p-value <0.01), Institutional delivery (p-value=0.023) and adequate antenatal visit (p-value=0.026) were important determinants of mother's knowledge of possible danger signs in their newborn. Development of danger signs in neonates was observed to be associated with 24.3% mothers having poor knowledge as compared to 42.3% mothers with good knowledge.

Conclusion: With less than 50% of mothers having a good knowledge of NDS healthcare workers have a lot of scope for educating and counselling the mothers, thereby, enabling them to recognise the early signs of illness in their newborn and ensuring timely presentation to healthcare facility and early clinical intervention.

Keywords: Care seeking behaviour, Fever, Lethargy, Refusal to feed

INTRODUCTION

In 2019, 2.4 million neonatal deaths were reported worldwide, or around 6,700 every day, with about 75% occurring within the first week [1]. Despite the fall in India's neonatal mortality rate from 57% in 1990 to 22% in 2019, according to United Nations reporting, the neonatal mortality is still highest in India with 5,22,000 neonatal deaths reported in 2019 in the country [1].

Neonates are less likely to exhibit overt symptoms of sickness. The initial symptoms are usually vague [2,3]. The World Health Organisation (WHO) Integrated Management of Newborn and Childhood Disease (IMNCI) focuses on assessing general danger signs in the evaluation of children presenting with illness at health care centres [4].

For the effective implementation of the IMNCI principles, it is important that the primary caregiver, the mother, is able to recognise the danger signs in a sick neonate. Because mothers' health-seeking behaviour is heavily reliant on their knowledge of Neonatal Danger Signs (NDS), it is possible to avoid associated mortality if mothers are aware of the appropriate manifestations of sickness in newborns [4].

There are various publications from other developing nations and few from Indian subcontinent with a smaller sample size focusing on the recognition and perception of NDS by family members and health care providers namely community health workers and midwives and seeking timely healthcare for sick newborns [3,5-7]. However, no study from Punjab region had been previously published.

Thus, the present study was solely dedicated to assess awareness of NDS amongst the mothers and factors affecting their care seeking behaviour. The results of the study will be useful as a starting point for future studies by other researchers.

MATERIALS AND METHODS

An Institution-based descriptive cross-sectional study was performed in Punjab Institute of Medical Sciences, Jalandhar, Punjab, India, from 31st January 2020 to 31st March 2020. The Institutional Ethics Committee of the Punjab Institute of Medical Sciences in Jalandhar granted ethical clearance (IEC/21/51).

Sample size calculation: Sample size was calculated keeping into consideration 95% confidence interval and to obtain 7% precision with the assumption that 50% mothers will have some knowledge of NDS. Total of 550 mothers were included in the study.

Inclusion criteria: A total of 550 primiparous and multiparous mothers who had given birth in the previous year and brought infant to be vaccinated during the study period (single visit only) were included in the study.

Exclusion criteria: Temporary caregivers who carried babies to be immunised were excluded from the study.

Data Collection

Each respondent gave written informed consent after the study's objectives were explained to them. The data was gathered using a structured questionnaire in regional language, Punjabi. The

questionnaire was adapted on basis of well recognised danger signs after extensive literature review [3-6]. A pilot study was conducted with the same questionnaire on mother of 20 newborns and based on the responses by the mothers the necessary changes were made in the questionnaire. To check the internal consistency, Cronbach's alpha was calculated which came out to be 0.75 which is acceptable. The final questionnaire had four section and 24 questions designed to collect details on socio-demographic profile, antenatal and postnatal visits, mother's prior knowledge on NDS and their experience with development of the same in their infants in first month of life [Annexure 1].

On basis of previous studies with similar aim, mothers who listed at least three hazard signs were considered to have a good knowledge of the signs. Awareness of 1-2 NDS was considered as poor knowledge and zero awareness was categorised as no knowledge [5,6,8]. The questionnaire was designed in English, translated to Punjabi and then re-translated by another translator to English to ensure consistency. Supervisors interviewed mothers face-to-face and ensured completeness of questionnaires before moving on to next participants. Necessary feedback was given to data collectors on weekly basis. Time taken for interview was 20 minutes.

Awareness of neonatal risk signs was the dependent variable. Socio-demographic variables (age, occupation of family, marital status, education level, and place of residence) and reproductive health variables like parity, place of delivery, antenatal care, and postnatal care services were the independent variables.

STATISTICAL ANALYSIS

Qualitative data was represented in the form of frequency and percentage. Association between qualitative variables was assessed by Chi-square test. A p-value <0.05 was taken as level of significance. Statistical Package for the Social Sciences (SPSS) version 21.0 software was used for statistical analysis.

RESULTS

The study included 550 mothers. A total of 267 (48.6%) mothers were between 18-28 years of age and 283 (51.4%) were between 29 to 40 years of age and all were married. Mean age of study participants was 26.5 years. A 5% of the study participants were illiterate and 95% had received some education. The population group was mainly urban {411/550 (74.7%)}, 539 (98%) mothers had Institutional deliveries and 479 (87.09%) of mother had four or more antenatal visits. A 219 (39.8%) had received advice on newborn care after delivery. A 247 (44.9%) study participants were primipara, 292 (53.1%) were multipara and 11 (2%) were grand multipara.

Most common danger sign known to mothers was fever (50%), followed by poor feeding (40.9%) and difficulty in breathing (19.09%). Meager 2.7% of mothers participating in the study were aware of convulsions as a danger sign in newborn and just 1.4% considered hypothermia (cold to touch) as alarming [Table/Fig-1]. Out of 550 mothers, 14.1% (78) had witnessed the NDS in their newborn with 5.6% having preterm deliveries and 4% of newborns developing fever in first 28 days of life.

The mean knowledge score of the study population was 2.49±1.59. 273 (49.6%) out of 550 mothers were found to have a good knowledge of NDS, 209 (38%) had poor knowledge and 68 (12.3%) had no knowledge about the NDS [Table/Fig-2].

As seen from [Table/Fig-2], educational status of the mothers was an important determinant of their awareness of NDS (p-value <0.01). Mothers with higher education were significantly more vigilant and aware of the signs of illness in their newborn. Institutional deliveries (p-value=0.023) and adequate (≥4) antenatal visits (p-value <0.01) also insured good knowledge of NDS. A 58.3% of all study participants belonged to families with a self-employed earning member and 23.4% were from agriculture background. A 61.1% out of self-employed families had a good knowledge of NDS. A

Symptom	Number of mothers aware of NDS (n, %)	Number of mothers whose newborns actually developed these symptoms (n, %)
Convulsion	15 (2.7%)	0
Fever	275 (50%)	22 (4%)
Cold to touch	8 (1.4%)	1 (0.18%)
Poor feeding/Sucking	225 (40.9%)	11 (2%)
Difficulty in breathing	105 (19.09%)	7 (1.2%)
Baby too small/Born too early	52 (9.4%)	31 (5.6%)
Umblical redness/Discharge	51 (9.2%)	0
Eye redness/Discharge	27 (4.9%)	1 (0.18%)
Yellow palms/Soles/Eyes	41 (7.4%)	5 (0.9)
Lethargy	18 (3.2%)	0
Unconscious	36 (6.5%)	0
Others	1 (0.18%)	0

[Table/Fig-1]: Frequency of awareness of Neonatal Danger Signs (NDS) included in study questionnaire and actual development of NDS in newborns of study participants.

Variables	N (%)	Knowledge of Neonatal Danger Signs (NDS)			p-value
		Good n (%)	Poor n (%)	Absent n (%)	
Age					
18-28 year	267 (48.6%)	154 (57.6%)	80 (29.9%)	32 (12%)	<0.01*
29-40 year	283 (51.4%)	119 (42%)	129 (45.5%)	36 (12.7%)	
Educational status of mother					
Illiterate	27 (5%)	3 (11.1%)	18 (66.6%)	6 (22.2%)	<0.01*
Did not complete primary education	30 (5.4%)	7 (23.3%)	13 (43.3%)	10 (33.3%)	
Primary education	84 (15.2%)	22 (26.1%)	30 (35.7%)	32 (38%)	
Secondary education	214 (39%)	119 (55.6%)	87 (40.6%)	8 (3.7%)	
Higher education	195 (35.4%)	122 (62.5%)	61 (31.2%)	12 (6.1%)	
Total	550	273 (49.6%)	209 (38%)	68 (12.3%)	
Place of delivery					
Institute	539 (98%)	271 (50.2%)	205 (38.1%)	63 (11.7%)	
Home	11 (2%)	2 (18.1%)	4 (36.3%)	5 (45.4%)	
Number of antenatal visit					
≥4 times	479 (87.0%)	235 (49.0%)	161 (33.6%)	49 (10.2%)	0.026*
<4 times	71 (13%)	26 (36.6%)	35 (49.2%)	12 (17%)	
Education regarding newborn care before discharge					
Yes	219 (39.8%)	120 (54.79%)	72 (32.8%)	27 (12.3%)	0.17
No	331 (60.1%)	153 (46.2%)	137 (41.3%)	41 (12.4%)	
Development of danger signs in neonate					
Yes	78 (14.18%)	33 (42.3%)	19 (24.3%)	27 (34.6%)	<0.01*
No	472 (85.8%)	240 (51%)	190 (40.2%)	41 (8.7%)	
Occupation					
Employed on wages	10 (1.8%)	0	1 (10%)	9 (90%)	<0.01*
Agriculture	129 (23.4%)	34 (26.3%)	67 (51.9%)	28 (21.7%)	
Self employed	321 (58.3%)	196 (61.1%)	102 (31.7%)	23 (7.1%)	
Business	90 (16.3%)	43 (47.7%)	39 (43.3%)	8 (8.8%)	
Total	550	273 (49.6%)	209 (38%)	68 (12.3%)	
Did you take your child to the hospital when your baby developed any of these signs					
Yes	407 (74%)	245 (60.2%)	160 (39.3%)	2 (0.5%)	<0.01*
No	143 (26%)	03 (2%)	53 (37%)	87 (61%)	

[Table/Fig-2]: Association between various factors and awareness of Neonatal Danger Signs (NDS) among postpartum mothers.
(Chi-square test); *p-value <0.05 is considered was significant

1.8% of all was employed on daily wages and had the maximum percentage of mothers with no knowledge of NDS amongst occupation group. A 74% mothers presented with their neonates immediately to the health care facility on development of NDS. The care seeking behaviour of the mothers was significantly associated with their knowledge regarding the danger signs (p-value <0.01).

DISCUSSION

It is possible to avoid neonatal mortality if mothers are aware of the appropriate manifestations of NDS [7]. Mothers' health-seeking behaviour is heavily reliant on their awareness of NDS [8]. Keeping these in mind, the study was designed to assess the awareness of NDS and health seeking behaviour of postpartum mothers attending tertiary health care centre in Jalandhar city of Punjab. It was found that 49.6% of postpartum mothers had a good knowledge of NDS. This percentage is higher than results from a study conducted in rural area of Lucknow where only 39.5% mothers had good knowledge of the danger signs [3]. The results of this study are, however, consistent with findings in Arba Minch General Hospital in Southern Ethiopia (40.9%) [9]. It is also much higher than results demonstrated in studies from Ethiopia's North West Amhara region (18.2%), Kenya (15.5%), four Ethiopian regions namely Oromia, Tigray, Amhara (29.3 %), Ethiopia's Ambo town (20.3 %), and Nepal (26.7%) [5,8,10-12].

This disparity may be due to the difference in demographic profile and education status of mothers. Also, as the study was conducted last year, the information made available over mass and social media over the years has exponentially increased which might have been helpful in increasing the knowledge. Also, mothers in rural areas were included in the study conducted in Ethiopia, Kenya and Nepal [9,10,13,14]. However, in the present study, as stated earlier, primarily mothers were from urban areas of the city.

Mothers between the ages of 18-28 were more likely to have a clear understanding of neonatal risk signs than mothers between the ages of 29-40. Similar results were found in studies in Woldiya, Ethiopia, and Nepal [13,14]. This could be due the fact that younger mothers, who were having their first child are more concerned about health of their child and compliant to doctor's advice.

Mothers who attended Antenatal Care Clinics (ANC) four times or more were more likely to have good knowledge than those who had not attended ANC during their pregnancy. These results are similar with those of North West Amhara, Ethiopia, and rural Uganda [8,15]. This re-emphasises the fact that ANC strengthens the mother's relationship with her doctor, allowing her to access more information about NDS. It was also found that in comparison to their counterparts, mothers who had obtained information regarding newborn care from health professionals were more likely to have good knowledge. The rationale for this may be that mothers who received information from health professionals found it more reliable than just hearsay and for health-related information for their children. The care seeking behaviour of the mothers was significantly associated with their knowledge regarding the danger signs. A comparative evaluation of similar studies has been presented in [Table/Fig-3] [3,9,10,14,15].

Author's name (year)	Place of study	Number of subject	Knowledge score	Conclusion
Present study	India (Urban)	550	49.6% mothers with good knowledge	Education status of mothers and adequate antenatal visits is associated with recognition of neonatal danger signs.
Awasthi S et al., (2006) [3]	India (Rural)	200	More than half of the samples recognised NDS, Healthcare was sought for 46 (23%) neonates	There is a need to give priority to implementing IMNCI, and possible incorporation of continuous crying as an additional danger sign.
Kibaru EG and Otara AM, (2016) [10]	Kenya	414	15.5% had good knowledge	Knowledge of neonatal danger sign was low among mothers attending well baby clinic.
Degefa N et al., (2019) [9]	Ethiopia	345	40.9% had good knowledge	Interventional strategies that stress strengthening maternal education and ANC follow-up should be extended.
Nepal M et al., (2018) [14]	Nepal (Rural)	117	48.18% had good knowledge	Based on the study findings, it is concluded that the more mature a mother is, the more the awareness on neonatal danger sign. To decrease neonate mortality, teaching must be provided on neonatal danger signs from the pregnancy to the delivery of baby.
Sandberg J et al., (2014) [15]	Uganda (Rural)	765	58.3% could identify one NDS 14.8% could identify two NDS. 26.9% couldn't identify any NDS	Indicate the need to enhance education of mothers, antenatal care as well as care to those discharged from health facilities after delivery. Further promotion of birth preparedness is required.

[Table/Fig-3]: Comparative evaluation of similar studies [3,9,14,15].
IMNCI: Integrated management of newborn and childhood disease; NDS: Neonatal danger sign; ANC: Antenatal care clinics

Limitation(s)

The study did not demonstrate the impact of joint family/nuclear family system and exposure to social media, both of which play an important role in determining mothers' awareness and family's care seeking behaviour.

CONCLUSION(S)

Statistically, important association between education status of mothers and adequate antenatal visits with recognition of NDS has been found in this study. The key take home message from the present study is that counselling for NDS should be delivered during antenatal visits which will be advantageous to ensure timely medical intervention and decrease neonatal morbidity and mortality. Health education should be delivered during antenatal stays, in postnatal wards, and in the Neonatal Intensive Care Unit. Thus, it would be advantageous and helpful to decrease neonatal morbidity and mortality before mothers are discharged from the hospital. The study findings also emphasises on the need to organise a newborn danger sign awareness program for mothers.

REFERENCES

[1] Organisation WH. Newborns: Reducing mortality: Key fact sheets. Geneva: World Health Organisation; 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/newborns-reducing-mortality.
[2] Stoll BJ. The global impact of neonatal infection. Clin Perinatol. 1997;24:01-21.
[3] Awasthi S, Verma T, Agarwal M. Danger signs of neonatal illnesses: Perceptions of caregivers and health workers in northern India. Bull World Health Organ 2006;84(10):819-26.
[4] WHO IMNCI World Health Organisation. Handbook IMNCI integrated management of neonatal and childhood illnesses. Geneva: WHO; 2003. WHO document WHO/FCH/CAH.
[5] Bulto GA, Fekene DB, Moti BE, Demissie GA, Daka KB. Knowledge of neonatal danger signs, care-seeking practice and associated factors among postpartum mothers at public health facilities in Ambo town, Central Ethiopia. BMC Res Notes. 2019;12(1):549.
[6] Guta A, Sema A, Amsalu B, Sintayehu Y. Knowledge of Neonatal Danger Signs and Associated Factors Among Mothers of <6 Months Old Child in Dire Dawa, Ethiopia: A Community Based Cross-Sectional Study. Int J Womens Health. 2020;12:539-48.
[7] Oza S, Lawn JE, Hogan DR, Mathers C, Cousens SN. Neonatal cause-of-death estimates for the early and late neonatal periods for 194 countries:2000-2013. Bulletin of the World Health Organisation. 2015;93(1):19-28.
[8] Nigatu SG, Worku AG, Dadi AF. Level of mother's knowledge about neonatal danger signs and associated factors in north west of Ethiopia: A community-based study. BMC Research Notes. 2015;8:309.

[9] Degefa N, Diriba K, Girma T. Knowledge about neonatal danger signs and associated factors among mothers attending immunisation clinic at Arba Minch General Hospital, Southern Ethiopia: A cross-sectional study. Biomed Res Int. 2019;2019:9180314. Available from: https://doi.org/10.1155/2019/9180314.
[10] Kibaru EG, Otara AM. Knowledge of neonatal danger signs among mothers attending well-baby clinic in Nakuru Central District, Kenya: Cross-sectional descriptive study. BMC Res Notes. 2016;9(1):481.
[11] Callaghan-Koru JA, Seifu A, Tholandi M. Newborn care practices at home and in health facilities in 4 regions of Ethiopia. BMC Pediatr. 2013;13(1):198.
[12] Tuladhar S. The determinants of good newborn care practices in the rural areas of Nepal. Nepal; 2010.
[13] Jemberia MM, Berhe ET, Mirkena HB, Gishen Dm, Tegegne AE, Reta MA. Low level of knowledge about neonatal danger signs and its associated factors among postnatal mothers attending at Woldia general hospital, Ethiopia. Maternal Health, Neonatology and Perinatology 2018;4(1). Available from: https://doi.org/10.1186/s40748-018-0073-5.
[14] Nepal M, Sarala KC, Nepal P, Poudel A, Maharjan S, Adhikari B. Awareness regarding neonatal danger signs among rural postnatal mother in Palpa District, Nepal. International Journal of Health Sciences & Research. 2018;8(11):194-200.
[15] Sandberg J, Pettersson KO, Asp G, Kabakyenga J, Agardh A, Rubens C. Inadequate knowledge of neonatal danger signs among recently delivered women in southwestern rural Uganda: A community survey. PLoS One. 2014;9(5):e97253.

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ANNEXURE 1

Section 1

- Name:
- Age:
- Marital status:
- Place of Residence:
- Education status of the mother:
  - -Illiterate
  - -Incomplete primary education
  - -Primary education
  - -Secondary education
  - -Higher education

Section 2

- Age of presenting baby
- Birth order
- No. of ANC (Antinatal Visits) visits 4 time or less
- Place of delivery:
  - -Hospital
  - -Health center
  - -Home

Section 3

Do you consider the following to be a danger symptom in your newborn:

Danger symptom	Yes	No
Fever		
Convulsion		
Cold to touch		
Unconscious		
Convulsion		
Poor feeding/Sucking		
Baby too small/Born too early		
Difficulty in breathing Eye redness/Discharge		
Umblical redness/Discharge		
Yellow palms/Soles/Eyes		
Any other symptoms		

Section 4

- Have you ever witnessed any of the abnormality in your newborn (presently or previous):- yes( ) or No( )

Did you take your child to the hospital when your baby developed any of these:- Yes( )or No( )